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NOTES AND COMMENTS.

THE PRESENT AND FUTURE OF MEDICAL SCIENCE.

MEDICINE—I take the term to mean that science, or art, if you will, that essays to effect the cure of diseases by means of substances administered to human beings—may be said to have advanced in a sort of spiral manner. Starting at a point, it has circled about it, slowly increasing the diameter of its rings. It has from time to time gradually enlarged and improved its old methods of diagnosis and treatment; but it has added very few new and original discoveries of value.

Until quite recently our pharmacopœia contained scarcely any remedial agents that were not known in some form one hundred years ago. Indeed, many of them were familiar to the ancients. During the past decade we have seen medicine eclipsed by the advancement of all the other arts and sciences. Surgery has made its greatest strides. Electricity has taken its place as a practical science. Chemistry has given us wonderful discoveries. The fruits of the other arts and sciences have afforded a rich harvest. It seems, in fact, to have been a ripening time for these.

Medicine has not kept abreast of its correlated sciences. In point of fact, it is far in their rear. The reason for this, I think, is two-fold. Medical science rests upon a foundation built of stones taken from the other arts and sciences. The first advances in *materia medica* were the outcome of discoveries in organic chemistry. The chemist extracted the alkaloids, and the physician then recognized them as the active principles of the drugs from which they came.

The discoveries in synthetical chemistry marked another epoch in medicine. By grouping elements obtained from certain organic compounds, chemistry produced for us new substances having medicinal properties of great value. Experiment has proved some of these to have specific curative effects. Electricity has furnished us remedial agents, and has enlarged our means of diagnosis. Improvements in the art of manufacturing microscopic lenses have enabled us to see the germs of diseases, and have opened up to us the great field of bacteriological chemistry that now engrosses the attention of the medical world.

Through the agency of the microscope we are now beginning to understand the real cause of disease processes, and the chemico-vital forces evolved by nature to effect their destruction.

In short, the dependence of medicine upon the other arts and sciences has kept its development in their wake. But there is another reason for the tardy development of medicine—an even more powerful one than that just

given. It is the great difficulty of proving that certain effects are due to certain causes ; whether the result of the given medical procedure is *post hoc* or *propter hoc*. So many factors operate to produce effects that it is often impossible to determine the real causative one. In no other science is it so easy to mistake coincidence for cause.

The proverbial disagreement of doctors is due to this. Homœopathy, faith cure, and other medical crazes are fathered by it. The anti-vaccinists, the anti-contagionists, find their arguments in mistaken premises. It is on account of this that medicine is, and probably always will be, an inexact science, and that theory has been productive of so little.

The few specifics (by specific I mean a medicine that has a certain curative effect upon a particular disease) have all been the outcome of experience from chance observation, and not of theoretical work. No science, however, is so rich in theories. It is significant that these in the main have been advanced to account for empirical facts. Innumerable have been the theories endeavoring to account for the action of cinchona, a drug for the existence of which we are indebted to the instinct of the Peruvian Indians. The theories attempting to account for the action of every medical agent and for the contagion of every disease are legion.

The differences in the so-called "temperaments" of individuals must always tend to prevent the exact in medicine. The old adage "One man's food is another's poison" finds its origin here.

It seems probable that in the near future the hypodermic syringe will be the principal means of administering remedial agents. This little instrument has already done something towards reducing the inexactness of medicine to a minimum.

The most remarkable thing in medical science to-day is the fewness of specific remedies. The comparatively recent discoveries in physiology and in the causes of diseases have not brought forth medicines that will act as sure cures. We are almost as powerless to cure the more severe types of diseases to-day as we were ten or twenty years ago. Our immense credulity is a witness to this, however strongly some of us may deny it. We are ready to accept the wildest assertions as proved facts. We have believed that condurango would cure cancer; that an elixir of life had been discovered; and now we think the specific for tuberculosis is in our hands, and this opinion is based almost on the assertion of one man.* The great wish that these things should be true is the father of the thought that they are, and it makes us deceive our very selves.

I know of no more trying position than that of the physician who, having in vain exhausted all the means known to him to save his patient's life, is compelled to watch him die without being able to do anything to avert the end. Is it to be wondered at that in our helplessness we grasp at straws? I would not be taken in these statements as belittling medical science and conveying the impression that the physician is useless. Far from it. We hold in our hands much that the test of time and experience has shown to be of great value in ameliorating diseased conditions.

The future of medicine, and especially of preventive medicine, seems very bright. It seems probable that the so-called "preventable diseases"—that is, the contagious and infectious maladies—will in time be actually avoidable.

* Written January, 1891.

The "preventive viruses" originated by Jenner in the discovery of vaccination, and added to by Pasteur in the discovery of anti-rabic and anti-charbon* virus, will play a most important part. The causes producing and the conditions favoring these diseases are well known. It seems probable that the bacilli causing them produce in some way poisons that are destructive to themselves, and that we shall sooner or later be in possession of means whereby we can isolate and utilize these principles, not only as preventive, but also as remedial, agents.

It is not likely, however, that our old methods will be superseded, or that any of them will be abandoned. It is not improbable that all the acute diseases, and many of the chronic, will be found to be caused by germs. I do not think we need fear that new maladies will appear to take the place of those that we may in the future be able to control, and so keep the results of beneficent discoveries from effecting good.

Recent researches have shown that nature effects the destruction of germs in several ways. The phagocytes, whose function was comparatively recently discovered by Metchnikoff, are probably the most powerful of these. The phagocytes are found in the blood. They are whitish spherical bodies, considerably larger than blood-corpuscles. They are found in great abundance in and about the seats of inflammation, and were here first observed by Metchnikoff to absorb and destroy the bacteria causing the disease processes. The experiment made by him to prove his observation is most interesting and ingenious.

It is not unreasonable to predict that we will learn how to favor the production of these organisms, and in this way assist nature in her fight against disease more directly and to the purpose than at present. The soluble ferments are thought by competent observers to be inimical to the bacilli of diseases. We may possibly be able to apply the means whereby these may be produced in infected systems. We can only conjecture, at the best, what the harvest of the discoveries in the field of bacteriology will be. Let us, at any rate, hope that our dreams of its richness will be realized.

We must not let our hopes deceive us into expecting too much, for it has been said, "Thus far shalt thou go and no farther"; and it would seem as though obstacles had been placed in the way of medical science which all the force of man is powerless to remove. The most difficult thing on earth for a man to understand is himself. The wonderful machine of brain and muscle, and the strange chemico-vital forces that supply energy to it, must, it seems to me, in the very nature of things, always remain to man more of a mystery than anything else material that he may have to do with.

After all has been said, it must be admitted that a proper observance of the rules of personal and public hygiene on the part of every individual belonging to the civilized world would do more to effect a reduction of the death-rate, and prolong the average duration of life, than any discoveries in the cure of diseases that at present seem within the bounds of possibility.

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RESCUE WORK AMONG FALLEN WOMEN.

"RESCUE homes are premiums on iniquity; by assisting girls to conceal their shame, they encourage them to repeat their offences." "They are establishments for the maintenance of the idle." "It is impossible to reform fallen women."

* Malignant pustule.